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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHOI, JACOB Y

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 08/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/938,777

Applicant(s)

CAO, DENSEN

Examiner

Jacob Y Choi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06/24/2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 108b, 220, 1239, 334, 337 & 701. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 108, 120, 121, 1209, 201, 336, 330, 331, 334b, 403a, 525f & 525e. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a well, a secondary heat sink a plurality of primary heat sinks, a dome, a plurality of vertical cavity, a

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plurality of apertures in the panel & a quantity of light reflective adhesive must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claims 12 & 17 are objected to because of the following informalities: phrase "the group consisting of LED"s and VCSEL"s" should be corrected as "the group consisting of LED's and VCSEL's". Appropriate correction is required.

6. Claim 26 is objected to because of the following informalities: phrase "said LED chip in order to covert monochromatic light emitted" should be corrected as "said LED chip in order to convert monochromatic light emitted". Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 32 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 32 recites the limitation "said dome" in line 16. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

10. Claims 5, 6, 7, 8, 24, 31 & 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Begemann (USPN 6,220,722).

Regarding claim 5, Begemann discloses an enclosure of light transparent material (5), a base of electrically conductive material (2), a heat sink located within the enclosure (3, 12), a plurality of light emitting diodes mounted on the heat sink (4), at least some of the light emitting diodes being capable of emitting light of wavelength in the range of from about 200 nanometers to about 700 nanometers (inherent that LEDs of Begemann is a visible light source, which includes violet, indigo, blue, green, yellow, orange & red), and the light emitting diodes being arranged on the heat sink in order to emit light in all directions other than to the base (Figure 4), electrical connection among the light emitting diodes, electrical connection of the light emitting diodes to the base (inherent).

Regarding claim 6, Begemann discloses a vacuum within the enclosure.

Regarding claim 7, Begemann discloses a gas (air = gas) within the enclosure.

Regarding claim 8, Begemann discloses the heat sink has a plurality of radially oriented sides and a top, each radially oriented sides and the top having a light emitting diode mounted on it.

Regarding claim 24, Begemann discloses an enclosure (5), the enclosure being fabricated from a material substantially transparent to white light, a base (2) to which the enclosure is mounted, an interior volume within the enclosure, a secondary heat sink located in the interior volume, the secondary heat sink (3) being capable of drawing heat from one or more semiconductor devices mounted on it, a surface mounted LED package mounted on the secondary heat sink, the surface mount LED package including, a primary heat sink (12), a well (Figures 3A-3D) located on the primary heat sink, the well being capable of receiving a semiconductor device therein, an LED chip (11) located in the well, the LED chip being capable of emitting light, and a dome located on the primary heat sink in order to cover the well and the LED chip and to fully enclose the LED chip between the primary heat sink and the dome (Figures 3a-3D).

Regarding claim 31, Begemann discloses an enclosure (5), the enclosure being fabricated from a material substantially transparent to white light, a base (2) to which the enclosure is mounted, an interior volume within the enclosure, a secondary heat sink located in the interior volume (3), the secondary heat sink being capable of drawing heat from one or more semiconductor devices mounted on it, a plurality of generally planar faces located on the secondary heat sink, a plurality of surface mounted LED packages mounted on a plurality of the faces of the secondary heat sink, at least one of

the LED packages including, a primary heat sink (12), a well (Shown in Figures 3A-3D) located on the primary heat sink, the well being capable of receiving a semiconductor device therein, an array of LED chips located in the well, the LED chips being capable of emitting light, and a focus dome (13) located on the primary heat sink in order to cover the well and the LED chip array and to fully enclose the LED chip array between the primary heat sink and the dome, the focus dome serving to focus light emitted by the LED array into a substantially coherent beam of light.

Regarding claim 32, Begemann discloses an enclosure (5), the enclosure being fabricated from a material substantially transparent to white light, a base (2) to which the enclosure is mounted, an interior volume within the enclosure, a secondary heat sink (3) located in the interior volume, the secondary heat sink being capable of drawing heat from one or more semiconductor devices mounted on it, a plurality of laser diode modules mounted on the secondary heat sink, at least one of the laser diode modules including, a primary heat sink (12), a well (Figures 3A-3D) located on the primary heat sink, the well being capable of receiving a semiconductor device therein, a diode laser located in the well (11), the diode laser being capable of emitting light, and a cover (13) located on the primary heat sink in order to cover the well and the diode laser and to fully enclose the diode laser between the primary heat sink and the dome.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1, 2, 4, 11-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Begemann (USPN 6,220,722).

Regarding claim 1, Begemann discloses an enclosure (5), the enclosure being fabricated from a transparent material through which visible light may pass, the enclosure being generally impermeable to gas, a base to which the enclosure is mounted (2), the base including a fitting of appropriate shape for inserting into a light bulb socket, an interior volume within the enclosure, a heat sink located in the interior volume (3, 12), the heat sink being capable of drawing heat from a semiconductor device mounted on the heat sink, a plurality of semiconductor devices (shown in all Figures), at least some of the semiconductor devices being capable of emitting light having a wavelength in the range of about 200 nanometers to about 700 nanometers (inherent that LEDs of Begemann is a visible light source, which includes violet, indigo, blue, green, yellow, orange & red), at least two of the semiconductor devices being mounted on the heat sink without any module physically isolating them from each other (Figures 3A-3D), a gas located within the enclosure (inherent, air = gas). Begemann discloses the claimed invention except for the specific details of an electrical connection between at least two of the semiconductor devices, an AC/DC converter, and an electrical connection between the AC/DC converter and the semiconductor devices. Since it is known in the art that a semiconductor devices normally requires DC power in order to operate properly, it would have been obvious to one of ordinary skill in the art at

the time this invention was made to provide the claimed AC/DC converter as additives in the Begemann LED lamp apparatus.

Regarding claim 2, Begemann discloses the claimed invention, explained above and it is inherent that an electrode is located on the base and an electrical connection is provided between the electrode and the AC/DC converter.

Regarding claim 4, Begemann discloses the claimed invention, explained above. In addition, either Begemann discloses at least one of the semiconductor devices is a light emitting diode.

Regarding claim 11, Begemann discloses a heat sink (3, 12), a plurality of wells on the heat sink (Figures 3A-3D), a plurality of semiconductor devices capable of emitting light (4), at least one semiconductor device located in each of the wells (Figures 3A-3D), an air chamber having an entrance (7) and an exit (6), a quantity of TE material located on the air chamber, a fan (9) located in the air chamber capable of drawing air into the entrance and forcing air out of the exit so that heat may be drawn away from the TE material and in turn drawn away from the heat sink and the semiconductor devices (Figure 1), a power module (2) for powering the light source. Begemann discloses the claimed invention except for the specific details of the power module including a fitting for installation in a traditional light bulb socket and an AC/DC converter for converting AC power from traditional building wiring to DC power usable by the semiconductor devices. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include specific details of an AC/DC converter being connected with the semiconductor device. It is well known in the art

that an AC/DC converter for converting AC power from traditional building wiring to DC power usable by a semiconductor devices, because semiconductor chip / LEDs requires DC power in order to operate.

Note: define TE

Regarding claim 12, Begemann discloses the semiconductor devices are selected from the group consisting of LED's and VCSEL's.

Regarding claim 13, a power module for powering the light source (2), the power module including a fitting for installation in a traditional light bulb socket, a heat sink (3, 12), the heat sink including a material selected from the group consisting of include copper, aluminum, silicon carbide, boron nitride natural diamond, monocrystalline diamond, polycrystalline diamond, polycrystalline diamond compacts, diamond deposited through chemical vapor deposition and diamond deposited through physical vapor deposition, a plurality of panels on the heat sink (shown in all Figures), the panels being generally planar in configuration, a plurality of semiconductor devices capable of emitting light (4), at least some of the panels hosting the semiconductor devices, and heat conductive adhesive bonding at least some of the semiconductor devices to the heat sink. Begemann discloses the claimed invention except for the specific details of and an AC/DC converter for converting AC power from traditional building wiring to DC power usable by semiconductor devices. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include specific details of an AC/DC converter being connected with the semiconductor device. It is well known in the art that an AC/DC converter for converting AC power from traditional building wiring

to DC power usable by a semiconductor devices, because semiconductor chip / LEDs requires DC power in order to operate

Regarding claim 14, Begemann discloses an air chamber in the heat sink for dissipating heat.

Regarding claim 15, Begemann discloses a fan (9) for forcing air through the air chamber in order to dissipate heat.

Regarding claim 16, Begemann discloses a quantity of TE material on the heat sink, the TE material being in electrical communication with the power module.

Note: define TE

Regarding claim 17, Begemann discloses the semiconductor devices are selected from the group consisting of LED's and VCSEL's.

Regarding claim 18, Begemann discloses the semiconductor devices include a quantity of semiconductor material located on a substrate.

Regarding claim 19, Begemann discloses the substrates are selected from the group consisting of electrically conductive substrates and electrically insulative substrates.

Regarding claim 20, Begemann discloses at least one well on the substrate, and wherein a semiconductor device capable of emitting light is located in the well.

Regarding claim 21, Begemann discloses at least one of the semiconductor devices is an LED array on the single semiconductor chip.

Regarding claim 22, Begemann discloses at least one of the semiconductor devices is a VCSEL array on a single semiconductor chip. The examiner takes Official

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Notice of the equivalence of LEDs and VCSEL for their use in the illumination and the selection of any of these known semiconductor devices would be within the level of ordinary skill in the art.

13. Claims 3, 9, 10, 23, 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Begemann (USPN 6,220,722) in view of Bill Schweber (LEDs move from indication to illumination).

Regarding claim 3, Begemann discloses the claimed invention except for a specific detail of coating. Schweber teaches that it is known to apply a suitable phosphorus filter / coating in the lens of the LED or a lens fabricated of molded epoxy, which serves to protect the chips and further shape both the LED's color spectrum and its luminous spatial distribution. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify a semiconductor light source with a luminous powder coating on the interior of the enclosure. Schweber states at page 78 & 80 that such a modifications would be obvious to shape the LED's color spectrum to create a white light.

Regarding claims 9 & 10, Begemann discloses the claimed invention except for a specific detail of coating. Schweber teaches that it is known to apply a suitable phosphorus filter / coating in the lens of the LED or a lens fabricated of molded epoxy, which serves to protect the chips and further shape both the LED's color spectrum and its luminous spatial distribution. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify a semiconductor light source with a luminous powder coating on the interior of the enclosure. Schweber states at

page 78 & 80 that such a modifications would be obvious to shape the LED's color spectrum to create a white light.

Regarding claim 23, Begemann discloses the claimed invention except for a specific detail of a quantity of phosphor of on the semiconductor device for converting single wavelength light emitted by the semiconductor device to white light useful to humans. Schweber teaches that it is known to apply a suitable phosphorus filter / coating in the lens of the LED or a lens fabricated of molded epoxy, which serves to protect the chips and further shape both the LED's color spectrum and its luminous spatial distribution. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify a semiconductor light source with a luminous powder coating on the interior of the enclosure. Schweber states at page 78 & 80 that such a modifications would be obvious to shape the LED's color spectrum to create a white light.

Regarding claim 25, Begemann discloses the claimed invention except for a specific detail of a phosphorous coating on the interior of the enclosure in order to convert monochromatic light emitted by the LED chip to white light. Schweber teaches that it is known to apply a suitable phosphorus filter / coating in the lens of the LED or a lens fabricated of molded epoxy, which serves to protect the chips and further shape both the LED's color spectrum and its luminous spatial distribution. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify a semiconductor light source with a luminous powder coating on the interior of

the enclosure. Schweber states at page 78 & 80 that such a modifications would be obvious to shape the LED's color spectrum to create a white light.

Regarding claim 26, Begemann discloses the claimed invention except for a specific detail of a phosphorous layer covering the LED chip in order to convert monochromatic light emitted by the LED chip to white light. Schweber teaches that it is known to apply a suitable phosphorus filter / coating in the lens of the LED or a lens fabricated of molded epoxy, which serves to protect the chips and further shape both the LED's color spectrum and its luminous spatial distribution. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify a semiconductor light source with a luminous powder coating on the interior of the enclosure. Schweber states at page 78 & 80 that such a modifications would be obvious to shape the LED's color spectrum to create a white light.

Regarding claim 27, Begemann discloses the claimed invention, explained above. In addition, Begemann discloses the dome (13) is a focus dome capable of focusing light emitted by the LED chip into a substantially coherent light beam.

Regarding claim 28, Begemann discloses the claimed invention, explained above. In addition, Begemann discloses a wall in the well (Figures 3A-3D), the wall serving to reflect light emitted by the LED chip to the dome.

Regarding claim 29, Begemann discloses the claimed invention except for a specific detail of phosphorous coating on the interior of the dome in order to convert monochromatic light emitted by the LED chip to white light. Schweber teaches that it is known to apply a suitable phosphorus filter / coating in the lens of the LED or a lens

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fabricated of molded epoxy, which serves to protect the chips and further shape both the LED's color spectrum and its luminous spatial distribution. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify a semiconductor light source with a luminous powder coating on the interior of the enclosure. Schweber states at page 78 & 80 that such a modifications would be obvious to shape the LED's color spectrum to create a white light.

Regarding claim 30, Begemann discloses the claimed invention, explained above. In addition, Begemann discloses a quantity of heat conductive adhesive located between the LED chip and the primary heat sink and serving to conduct heat from the LED chip to the primary heat sink.

Double Patenting

14. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

15. Claims 13-32 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of

copending Application No. 09/939,488. Although the conflicting claims are not identical, they are not patentably distinct from each other because the conflicting claims merely use different terminology to claim the same invention as the invention claimed in 09/09/939,488.

The conflicting claims are -

Claims 13-23 and copending application No. 09/939,488 claims 1-16

Claims 24-30 and copending application No. 09/939,488 claims 1-16

Claim 31 and copending application No. 09/939,488 claims 1-16

Claim 32 and copending application No. 09/939,488 claims 1-16

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Deese (USPN 5,806,965) – LED beacon light

Johnson (USPN 5,463,280) – light emitting diode retrofit lamp

Anderson (USPN 5,575,459) – light emitting diode lamp

Madadi et al. (USPN 5,688,042) – LED lamp

Uchida (USPN 4,727,289) – LED lamp

Ruskouski (USPN 5,655,830) – lighting device

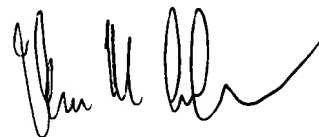
Abtahi et al. (USPN 5,890,794) – lighting units

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Y Choi whose telephone number is (703) 308-4792. The examiner can normally be reached on Monday-Friday (9:30-6:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703) 305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-8303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-7724.

JC
August 23, 2002



THOMAS M. SEMBER
PRIMARY EXAMINER